

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

What is claimed is:

1. (Currently Amended) A medical device for the treatment of abnormal tissue growth in a patient's body comprising:

a power source;

circuitry coupled to said power source;

at least one electrode operably coupled to said circuitry wherein said circuitry delivers direct current electrical therapy involving multiple voltages to said at least one electrode continuously for a period of time not less than 1 minute for the treatment of abnormal tissue growths;

a catheter operatively implanted into the patient's body and into contact with the abnormal tissue growth for delivering a therapeutic agent to the abnormal tissue growth, said catheter having a central lumen open at a proximal end and a distal end, the distal end positioned at or near the abnormal tissue growth and the proximal end positioned external to the body and away from the abnormal tissue growth; and

a porous drug absorbing material coupled to the distal end of the catheter, said porous material in contact with a surface portion of the abnormal tissue growth; and

an electrode array comprising a plurality of electrodes coupled to the circuitry and configured to steer the therapeutic agent along a predetermined path

from the catheter distal end, said array comprising a plurality of point electrodes configured on the porous material.

2. (Canceled)
3. (Currently Amended) The device of claim 1 wherein said direct current electrical therapy is applied ~~at a voltage~~ for a time period of between 1 minute and 1 day.
4. (Currently Amended) The device of claim 1 wherein said direct current electrical therapy is applied ~~at a voltage~~ for a time period of between 1 hour and 1 week.
5. (Currently Amended) The device of claim 1 wherein said direct current electrical therapy is applied ~~at a voltage~~ for a time period of between 1 and 120 minutes.
6. (Previously Presented) The device of claim 1 wherein said device monitors and senses at least one voltage from within a tissue of the patient's body.
7. (Original) The device of claim 6 wherein said direct current electrical therapy is adjusted according to the sensed tissue voltage.
8. (Original) The device of claim 7 wherein said direct current electrical therapy is applied for a time period between 1 hour and 1 month.
9. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy alternates between positive and negative voltages at periodic intervals of at least about one hour to avoid corrosion of the at least one electrode.
10. (Original) The device of claim 1 further comprising an electrical port contact coupled to said device in order to receive externally generated electrical therapies.

Claims 11-18 (Canceled)

19. (Currently Amended) The device of claim 1 wherein said direct current electrical therapy is applied at ~~a-voltages~~ between 1 volt and 20 volts.

20. (Canceled)

21. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at voltages and time periods sufficient for changing the pH by at least 2.0 inside or around said abnormal tissue growth.

22. (Currently Amended) The device of claim 1 wherein said direct current electrical therapy is applied at ~~a-voltages~~ between 20mV and 500mV.

23. (Canceled)

24. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

25. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied at a voltage between 100mV and 50 volts.

26. (Canceled)

27. (Previously Presented) The device of claim 1 wherein the plurality of electrodes are arranged in an arc around the distal end of the catheter.

28. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a pulse width of between 100 μ s and 20 ms.

29. (Previously Presented) The device of claim 1 wherein said direct current electrical therapy is applied as a series of voltage pulses wherein said voltage pulses have a spacing period of between 100 μ s and 1 second.

30. (Original) The device of claim 29 wherein said voltage pulses number between 1 and 10,000.

31. (Previously Presented) The device of claim 1 wherein said electrical therapy is applied at voltages and pulse widths sufficient to force open tumor cell membranes.

32. (Canceled)

33. (Canceled)

34. (Previously Presented) The device of claim 33 wherein said power source is implanted within the patient's body.

35. (Previously Presented) The device of claim 34 wherein said direct current electrical therapy is applied for a time period between 10 minutes to 1 hour.

36. (Canceled)

37. (Previously Presented) The device of claim 1 further comprising an electrical port contact coupled to said device and at least partially implanted in the patient's body in order to receive externally generated electrical pulses from a power source external to the patient's body.

38. (Previously Presented) The device of claim 1 further comprising at least one device selected from the group consisting of a drug reservoir, a drug pump, a communication means to synchronize said direct current electrical therapy with a drug delivery system, and circuitry to alternate output polarities to reduce levels of electrode corrosion and degradation.

39. (Previously Presented) The device of claim 1, wherein the electrode is internally connected to the catheter.

40. (Previously Presented) The device of claim 1, wherein the electrode is externally connected to the catheter and the catheter is configured to deliver a therapeutic agent.

41. (Previously Presented) The device of claim 40, wherein the catheter has a plurality of openings placed in contact with a plurality of portions of the abnormal tissue growth.

42-63. (Canceled)

64. (Previously Presented) The device of claim 1, further comprising:
a porous membrane extending across the lumen of the catheter; and
at least one catheter electrode having a porous extension, the catheter electrode operatively connected to said circuitry to provide electrical therapy and positioned on an exterior surface of the catheter, with the porous extension extending through the catheter and into alignment with the porous membrane in the lumen in order to regulate the delivery of the therapeutic agent while the catheter electrode provides electrical therapy.

65. (Previously Presented) The device of claim 64 further comprising circuitry to alternate output polarities of the first and second electrodes to reduce levels of electrode corrosion and degradation.

66. (Previously Presented) The device of claim 64 further comprising an electrical port contact coupled to said device and implanted into the patient's body in order to receive externally generated electrical therapies.

67. (Previously Presented) The device of claim 64 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

68. (Previously Presented) The device of claim 1, wherein the catheter has multiple apertures for delivering the therapeutic agent.

69. (New) A medical device for the treatment of abnormal tissue growth in a patient's body comprising:

a power source;

circuitry coupled to said power source;

at least one electrode operably coupled to said circuitry wherein said circuitry delivers direct current electrical therapy involving multiple voltages to said at least one electrode continuously for a period of time not less than 1 minute for the treatment of abnormal tissue growths;

a catheter operatively implanted into the patient's body and into contact with the abnormal tissue growth for delivering a therapeutic agent to the abnormal tissue growth, said catheter having a central lumen open at a proximal end and a distal end, the distal end positioned at or near the abnormal tissue growth and the proximal end positioned external to the body and away from the abnormal tissue growth;

a porous drug absorbing material coupled to the distal end of the catheter, said porous material in contact with a surface portion of the abnormal tissue growth; and

an electrode array comprising a plurality of electrodes coupled to the circuitry and configured to steer the therapeutic agent along a predetermined path from the catheter distal end; and

at least two concentric electrodes arranged within the porous material.

70. (New) The device of claim 69 wherein said direct current electrical therapy is applied at voltages between 20mV and 500mV.

71. (New) The device of claim 69 wherein said direct current electrical therapy is applied at voltages and time periods sufficient to attract white blood cells.

72. (New) The device of claim 69 further comprising an electrical port contact coupled to said device and at least partially implanted in the patient's body in order to receive externally generated electrical pulses from a power source external to the patient's body.

73. (New) The device of claim 64 further comprising circuitry to alternate output polarities of the first and second electrodes to reduce levels of electrode corrosion and degradation.

74. (New) The device of claim 69, further comprising:
a porous membrane extending across the lumen of the catheter; and
at least one catheter electrode having a porous extension, the catheter electrode operatively connected to said circuitry to provide electrical therapy and positioned on an exterior surface of the catheter, with the porous extension extending through the catheter and into alignment with the porous membrane in the lumen in order to regulate the delivery of the therapeutic agent while the catheter electrode provides electrical therapy.